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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/784,967

02/25/2004

Jun-young Kim

249/449

8477

7590

03/07/2006

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EXAMINER

SOWARD, IDA M

ART UNIT

PAPER NUMBER

2822

DATE MAILED: 03/07/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/784,967

Applicant(s)

KIM ET AL.

Examiner

Ida M. Soward

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 19 December 2005.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-41 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1,9,22,23,27 and 37 is/are rejected.
- 7) ☒ Claim(s) 2-8,10-21,24-26,28-36 and 38-41 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

DETAILED ACTION

This Office Action is in response to the Applicants' amendment filed December 19, 2005.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1, 9, 23 and 27 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kosaka (5,361,273) in view of Frey (5,920, 078).

In regard to claim 1, Kosaka teaches an optoelectronic device, comprising: a substrate 18; a doped region 1, formed on a first surface of the substrate 18; a light-emitting device section formed on the first surface of the substrate 18; and a light-receiving device section formed on the first surface of the substrate 18, wherein the light-emitting device section and the light-receiving device section use the doped region 1 in common (Figure 4, column 7 and 9, lines 1-68 and 31-39, respectively).

In regard to the limitation "for and providing photoelectrical conversion", claims directed to apparatus must be distinguished from the prior art in terms of structure rather than function, *In re Danly*, 263, F.2d 844, 847, 120 USPQ 528, 531 (CCPA 1959).

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Apparatus claims cover what a device is, not what a device does. *Hewlett-Packard Co. v. Bausch & Lomb Inc.*, 909 F.2d 1464, 1469, 15 USPQ2d 1525, 1528 (Fed. Cir. 1990).

In regard to claim 23, Kosaka teaches an optical transceiver, comprising: an optoelectronic device panel having an array of optoelectronic devices capable of detecting and emitting an optical signal arranged in a substrate 18; and an electrode structure selectively controlling detection and emission of each of the optoelectronic devices, wherein each of the optoelectronic devices includes: a doped region 16, formed on a first surface of the substrate 18; a light-emitting device section formed on the first surface of the substrate 18; and a light-receiving device section formed on the first surface of the substrate 18, wherein the light-emitting device section and the light-receiving device section use the doped region in common (Figure 4, column 7 and 9, lines 1-68 and 31-39, respectively).

However, Kosaka fails to teach a silicon optoelectronic device, an n- or p-type silicon-based substrate and a doped region doped to be an opposite type from that of the substrate.

Frey teaches a silicon optoelectronic device, an n- or p-type silicon-based substrate 12 and a doped region 18 doped to be an opposite type from that of the substrate 12 (Figure 5, column 3, lines 14-66).

Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the optoelectronic device structure as taught by Kosaka with the optoelectronic device having a silicon optoelectronic device, an n- or p-type silicon-based substrate and a doped region doped to be an opposite type from

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that of the substrate as taught by Frey to solve the problem of silicon not being an efficient and useful light emitter (column 1, lines 66-67).

In regard to claims 9 and 27, Frey teaches the light-receiving device section, the substrate 12 and the doped region form an MOS transistor structure (Figure 5, column 3, lines 14-66).

Claims 22 and 37 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kosaka (5,361,273) and Frey (5,920, 078) as applied to claims 1, 9, 23 and 27 above, and further in view of Craig et al. (US 2002/0181915 A1).

Kosaka and Frey teach all mentioned in the rejection above.

However, Kosaka and Frey fail to teach a monocrystalline silicon wafer.

Craig et al. teach a monocrystalline silicon wafer 22 (Figure 1, page 2, paragraph [0033]).

Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the optoelectronic device structure as taught by Kosaka and the optoelectronic device having a silicon optoelectronic device, an n- or p-type silicon-based substrate and a doped region doped to be an opposite type from that of the substrate as taught by Frey with the silicon optoelectronic device having a monocrystalline silicon wafer as taught by Craig et al. to include a material having a small number of defects (page 2, paragraph [0031]).

Allowable Subject Matter

Claims 2-8, 10-21, 24-26, 28-36 and 38-41 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Response to Arguments

Applicant's arguments with respect to claims 1, 9, 22-23, 27 and 37 have been considered but are moot in view of the new ground(s) of rejection.

Conclusion

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

The following patents are cited to further show the state of the art with respect to silicon optoelectronic devices:

Ando et al. (US 6,552,373 B2)

Kadota et al. (US 6,355,945 B1)

Kosaka (5,293,393)

Kuniyasu (US 2003/0136969 A1)

Morikawa (5,793,060)

Nakagawa et al. (5,838,174)

Olbright et al. (5,283,447)

Onodera (5,101,246)

Romano et al. (US 6,744,072 B2)

Wanlass (5,391,896).

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Ida M. Soward whose telephone number is 571-272-

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1845. The examiner can normally be reached on Monday - Thursday 6:30am to 5:00pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Zandra V. Smith can be reached on 571-272-2429. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

IMS

March 3, 2006

John M. Swann

AU 2822